

Claims

1. A method for strengthening the structure of a protein-containing product during a heat treatment of said product by forming disulfide bonds between the proteins
5 to form a protein space network, **characterized** in that the method comprises
– adding modified protein to said product before said heat treatment, which protein is modified by cleaving at least one disulfide bond originally present in said protein to obtain free sulfhydryl groups, and
– heating said product for 15 minutes or less to cause an interchange reaction by
10 said free sulfhydryl groups wherein said structure strengthening disulfide bridges will be formed between proteins.
2. The method of claim 1, **characterized** in that said heating temperature is 70–85 °C.
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3. The method of claim 1 or 2, **characterized** in that said protein has been modified by contacting it with sulfite ion forming reagent to sulfonate said protein.
4. The method of claim 3, **characterized** in that said sulfite ion forming reagent
20 comprises alkali metal or earth alkali metal sulfite, hydrogen sulfite or metabisulfite or combinations thereof.
5. The method of any of the preceding claims, **characterized** in that the amount of free sulfhydryl groups in the total protein of the product before the interchange
25 modification is 0.5–60 µmol/g protein.
6. The method of any of the preceding claims, **characterized** in that said modified protein comprises any edible protein.
- 30 7. The method of any of the preceding claims, **characterized** in that said modified protein comprises whey protein.
8. The method of any of the preceding claims, **characterized** in that said modified protein comprises soy protein.
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9. The method of any of the preceding claims, **characterized** in that said protein-containing product is food product, animal fodder or pet food.

10. The method of claim 9, **characterized** in that said food product is yoghurt, pudding, spread, other milk product or dough.
- 5 11. A protein-containing product comprising a protein space network strengthening the structure of said product, which network is formed by disulfide bonds in a heat treatment between proteins, **characterized** in that said protein network is created by adding modified protein to the product before said heat treatment, which protein is modified by cleaving at least one disulfide bond originally present in said protein to obtain free sulfhydryl groups, and said structure strengthening disulfide
10 bonds are formed in an interchange reaction caused by said free sulfhydryl groups during a heat treatment of 15 minutes or less .
12. The protein-containing product of claim 11, **characterized** in that said heating temperature is 70–85 °C.
- 15 13. The protein-containing product of claim 11 or 12, **characterized** in that said protein has been modified by contacting it with sulfite ion forming reagent to sulfonate said protein.
- 20 14. The protein-containing product of any of the claims 11–13, **characterized** in that said sulfite ion forming reagent comprises alkali metal or earth alkali metal sulfite, hydrogen sulfite or metabisulfite or combinations thereof.
- 25 15. The protein-containing product of any of the claims 11–14, **characterized** in that the amount of free sulfhydryl groups in the total protein of the product before the interchange modification is 0.5–60 $\mu\text{mol/g}$ protein.
- 30 16. The protein-containing product of any of the claims 11–15, **characterized** in that said modified protein comprises any edible protein.
17. The protein-containing product of any of the claims 11–16, **characterized** in that said modified protein comprises whey protein.
- 35 18. The protein-containing product of any of the claims 11–17, **characterized** in that said modified protein comprises soy protein.
19. The protein-containing product of any of the claims 11–18, **characterized** in that said protein-containing product is food product, animal fodder or pet food.

20. The protein-containing product of claim 19, characterized in that said food product is yoghurt, pudding, spread, other milk product or dough.